GUIDELINES FOR REDUCING BIRD AND BAT IMPACTS FROM WIND DEVELOPMENT IN CALIFORNIA

STAFF WORKSHOP #3 SUMMARY
SEPTEMBER 27-28, 2006

Wednesday, September 27, 2006

I. Introductions, Workshop Objectives and Agenda Review

Misa Ward of the California Energy Commission's (CEC) Siting Division welcomed all participants to the workshop. Paul De Morgan, Senior Mediator with RESOLVE, initiated a round of introductions and reviewed the meeting objectives and documents. Mr. De Morgan indicated the focus of this meeting was on the topics of impacts and mitigation, including California Environmental Quality Act (CEQA)-related perspectives, as well as a brief overview of the proposed approach for guideline drafting and subsequent revisions.

He also offered that the intent is to share ideas rather than achieve consensus; encouraging participants to use this opportunity to share thoughts but to also use written comments as a venue for feedback and contributions. It was noted that it would be helpful to refer to specific discussion questions listed on the agenda when providing written comments if applicable. Mr. De Morgan reviewed the ground rules and the group then turned their attention to the first agenda item.

II. Updates Since Last Workshop

Ms. Ward provided a brief overview of the guideline development process to date. This overall proceeding was initiated on June 9, 2006 at a CEC Committee hearing chaired by the Renewables Committee. This was a formal hearing to introduce the guidelines development process and to seek public input on both the scope and the content. On July 28 the first Staff Workshop was held. CEC previewed general guideline topics including the need and purpose in relation to local, state and federal laws, as well as the consideration of whether/how to incorporate content from existing guidelines. The second Staff Workshop was held on August 28-29 and focused on pre-permitting and operational monitoring, and sources of data that influence pre-permitting surveys. Various presentations were given regarding California wind areas, the overall wind project development process as well as overviews of the current state of knowledge regarding wind project impacts to birds and bats. The third Staff Workshop, as already mentioned, focuses on the topics of impacts and mitigation.

Julia Levin of Audubon California asked if the date(s) and location for the next Staff Workshop were confirmed. Ms. Ward responded that this specific information was not yet known, but input from stakeholders on this topic would be solicited the following day. She added that the general timeframe is looking to be sometime in November. Ms. Levin noted that this discussion was scheduled as an agenda item the second afternoon and requested the discussion be moved to the morning if appropriate. The group agreed.

III. Impacts and Mitigation in the Context of CEQA and State Wildlife Laws

A. CEQA Context for Impact Analysis and Mitigation – *Anne Mudge, Morrison and Foerster* [1]

Anne Mudge introduced herself as a CEQA and permitting lawyer working in California for 20 years in wind and other energy arenas. She noted the current dilemma of determining how to encourage wind development while ensuring protection of birds. The National Academy of Sciences released a report stating that the planet is the hottest it has been in 400 years. The movie "An Inconvenient Truth" has brought the issue of global warming alive for the public. Global warming is a looming environmental problem and wind energy will play a large role in addressing the issue of global warming. Ms. Mudge proceeded to share her presentation with the group.

Before initiating conversations centered on the discussion questions below, attention was turned to Scott Flint for another presentation.

B. California Department of Fish and Game (CDFG) Perspective on Impacts and Mitigation – CEQA and Other Laws – *Scott Flint, CDFG* [2]

Scott Flint introduced himself as the CDFG Program Manager for statewide programs dealing with California Endangered Species Act (CESA) and CEQA, timber harvest (planning and review), and lake and Streambed Alteration programs. CDFG provides policy direction, development interface, guidance and coordination between the CDFG Director and other regions on statewide issues such as this.

Mr. Flint reminded the group that he briefly discussed CDFG's perspectives on the content and process for development of the guidelines during the first Staff Workshop and will revisit this perspective today to provide further clarification. Mr. Flint then provided an overview of CDFG's perspective on impacts and mitigation.

C. Discussion Questions

Mr. De Morgan first encouraged initial reactions and clarifying questions in response to both presentations. Ms. Levin thanked Ms. Mudge for her constructive overview and noted it was important not to lose sight of wildlife laws given that the CEQA process focuses solely on information standards. It is important to streamline the wind development process and level the playing field but the focus of the guidelines should not be limited to CEQA only. There is a need to include the questions of "how much" and "when" with respect to mitigation. Wildlife laws and CEQA do not mesh together perfectly therefore it is essential to create a reasonable approach for balancing the two to ensure wind power is expanded in a streamlined manner.

Bronwyn Hogan of CDFG introduced the cautionary note that while the possibility of green-lighting wind areas should be explored there is a risk for unexpected impacts given the current limited knowledge about bats. If a green-lighting process is established, rigorous operations monitoring is needed as well as some mechanism/method to deal with (unexpected) impacts if they arise post-development. Susan Sanders of CEC requested clarification from the group on whether or not it seemed plausible that some green-lighted projects may not require a significant level of operations monitoring. Ms. Hogan replied that there should be a basic level of monitoring conducted at every

[1] A copy of this presentation can be found on the CEC website at http://www.energy.ca.gov/renewables/06-OII-1.
[2] A copy of this presentation can be found on the CEC website at http://www.energy.ca.gov/renewables/06-OII-1.

site to be compared across projects; it may not be necessary to require more monitoring but certainly not less than a minimum to ensure that there are not significant impacts occurring to bats in particular.

Brenda LeMay of Horizon Wind Energy agreed with the concept of a standardized approach and protocol but noted that all projects are not equal. In response to an inquiry regarding whether or not CDFG believes this to be true, Mr. Flint stated that there should be levels of options and sideboards based on types of project impacts. Different levels of impact are tied to different levels of CEQA analysis; some project sites have more information available than others, some need a decision matrix to deal with the complexity and diversity of sites.

Lorelei Oviatt of Kern County Planning stated the Oasis project is not doing mitigated negative declarations and that assessments are being conducted for areas outside of the established wind resource area (WRA). She commented that the guideline development process provides an opportunity to look at impacts to (sensitive) species present and create programmatic mitigation approaches with the intent of balancing wildlife protection and provision of wind energy. Kern County is considering drafting a programmatic/master Environmental Impact Report (EIR) and believes there is a need to create levels/categories of projects and possibly even green-lighted areas. She expressed her interest in CDFG providing protocols for studies when drafting general guidelines that are not cast in stone to account for each project's unique attributes. Lead agencies are often caught in the middle and need some guidance and flexibility to meet all interests and help in prioritizing project sites for development.

Andy Linehan of PPM Energy expressed the hope that the guidelines help industry comply with CEQA and game laws (that have no take provisions and do not allow for any level of impact); raising a series of questions for consideration. When looking at a goal of no net loss are the same standards applied to other industries that have an impact(s) on birds? If so, is the standard applied in a consistent way? Does global climate change play into the level of compensation/mitigation required of industries?

Julie Vance of CDFG responded that wind energy has had to mitigate a little less than others (e.g., residential subdivisions) and has more flexibility. It is also possible to consider positive aspects of projects when statutes allow for it. Mr. Flint added that CDFG tries to be as consistent as possible. There are comparable examples such as wetlands that have a no net loss goal and where the same mitigation is required for all but the wind industry has some unique issues and impacts. Finally it was noted that global warming has been identified internally at CDFG as an issue that needs to be addressed.

Kenny Stein of FPL Energy offered the hypothesis that if wind is replacing fossil fuel generation and it is at times difficult to have confidence in avian mortality numbers it might be appropriate to give a credit for losses that are mitigated. Ms. Levin agreed that there is value in wind power combating global warming otherwise Audubon and others would not be at the table trying to find a reasonable balance while ensuring wildlife laws are not disregarded. Mr. Stein added that he thought he heard CDFG say it was statutorily unable to make any compromises which makes him nervous. Mr. Flint replied that CDFG can be somewhat flexible and stakeholders will need to work with CDFG and each other to solve this problem. He reiterated the importance of pre-permitting and operations data collection to help inform decision-making and added that there is a need to be creative about what is considered to be an offset(s).

Ms. Mudge stated that one possible interaction between CEQA and game laws is that CEQA requires feasible mitigation which could at times be used to support enforcement discretion if it is

demonstrated that everything possible has been done to avoid and/or mitigate impacts. Compensatory mitigation for species-based impacts is a hopeful area for further discussion.

Peter Bloom, a biological consultant and member of the Science Advisory Committee, countered that while CEQA analyses may result in findings of no significant impacts and as result not require mitigation, the project impacts could still violate two acts of Congress (Migratory Bird Treaty Act and Bald Eagle Protection Act). This impact could be perceived as significant by the public in any other context. There should be some form of compensatory mitigation required for wind development to go forward. If a project finds its operations to be annihilating birds and/or bats then there is also an ethical and moral significance that should be considered. Biological surveys must be conducted to be certain about impacts up front. While there are many causes of avian mortality (radio towers, cars, cats etc.), no other industry than wind is known to have a greater impact on birds of prey. As this is impact is fairly exclusive to the wind industry it must be addressed by the wind industry.

Joel Klipp of Anemos Consulting introduced himself as a consultant who works with wind proponents on site identification, acquisition and development. Many in the wind industry would prefer the guidelines not take a shotgun approach, as standardization is import not only to developers (who are risking capital) and for counties where land is limited, pushing development out across the state. This geographical expansion creates a dynamic where county planners are being bombarded with questions and concerns. The guidelines need to help counties navigate these processes.

The group then turned its focus to the following questions:

1. *When should a lead agency require compensatory mitigation? When should a lead agency require post-construction monitoring?*

Nancy Rader of the California Wind Energy Association (CalWEA) replied it depends on the degree of uncertainty that exists. If there is confidence impacts are low or are sufficiently mitigated (based on initial determinations) further studies should not be required.

Ms. Hogan responded that while the approach may change over time, it is currently difficult to imagine a project not conducting operations monitoring to assess impacts to bats. We do not know enough now and it will be some time before there is enough information collected to be able to state with certainty that operations monitoring is unnecessary based on pre-permitting survey results alone. She suggested that a floor be established so data can be compared across sites. Given the guidelines are intended to be a living document this baseline level of operations monitoring can change over time if appropriate. Ms. Vance agreed that in many cases it would be hard to say operations monitoring was not needed. Although CDFG does not want to require compensatory mitigation if impacts are unknown, there should be some operations surveying conducted to ensure nothing was missed.

Mr. Stein hypothesized that if an acceptable level of operations monitoring was conducted and results indicated an acceptable level of impacts to bats was occurring and a project was doing in-fill to an adjacent area that is essentially the same. He asked the group if additional operations monitoring would have to be conducted at the adjacent site as well. Mr. Stein added his opinion that if impacts were occurring at the existing area and mitigation was going to be implemented to prevent impacts at the adjacent area, it would make sense to only mitigate at the new site rather than conducting more studies to assess the impacts.

Ms. Hogan noted that the issue really is how to define adequate mitigation, but unfortunately we do not have enough information right now to know for sure. Patterns do indicate that for bats there is likely a seasonal migratory relationship to impacts. Ms. Hogan stated that it could be effective to limit mitigation to times when bats migrate through an area but it is not certain that that approach would be effective. She added that she did not think it would ever be appropriate to completely avoid operations monitoring as 1) there appears to be micro-scale (project) differences that could lead to significant differences in impacts from site to site and 2) global warming may impact migration routes and timing leading to impacts changing over time.

Mr. Bloom stated that it cannot be known if compensatory mitigation is warranted if no operations monitoring is conducted. At Altamont, if CEQA did not require mitigation measures the only other trigger would be through the back door (via MBTA, Bald Eagle Protection Act) when mortality was shown to be chronic.

2. *What is the appropriate role for CDFG and USFWS to assist lead agencies in determining if data from other studies are applicable and adequate for developing impact assessments and mitigation measures?*

Ms. Rader responded that at the last workshop it was noted developers need certainty about mitigation as open-ended mitigation for projects would not be financially viable. She expressed frustration about the current void of information regarding bats as correlation studies cannot be conducted, there are no lower cost techniques for studies yet higher cost study techniques do not provide all the answers.

Ms. Oviatt noted it would be a disincentive to industry if the guidelines required a baseline of 20 years of operations monitoring to figure out the appropriate level of compensation. Industry will likely want to compensate up front instead to get around the uncertainty. As a lead agency representative, she could not include a clause in CEQA documentation stating we will monitor for 20 years and at Year 10 figure out compensation. She relies on state agencies (CFWS and CDFG) as the experts, with applicants also providing their own biologists and additional information. CDFG should work with counties and project proponents to provide adequate direction without dis-incentivizing this industry. Samantha Murray of the Golden Gate Audubon Society responded that she does not want to disincentivize industry but she cannot endorse a project that has no mechanism in place to assess impacts and the effectiveness of measures taken. There needs to be some adaptive management component or some correlation between pre-permitting and operations monitoring results.

Linda Spiegel of CEC noted that pre-permitting assessments help formulate a prediction, which engenders a great deal of uncertainty. Operations monitoring provides validation for the predictions therefore it would be most appropriate to conduct intense operations monitoring for a few years then ramp it down to a periodic frequency.

Ms. Levin stated that operations monitoring provides confirmation of pre-permitting predictions as well as for compensatory mitigation. There is a need to look at cumulative impacts as well, given uncertain environments and that all the impacts and answers are not known. Just as much as industry requires certainty for financial investments, The Audubon Society requires certainty regarding enforcement of environmental laws. We want to see the wind industry expand but it is a leap of faith that all impacts can be mitigated. She suggested moving forward cautiously, gathering information and striving for greater certainty in all areas in time (e.g., 10 years).

Ms. Levin agreed that the burden of operations monitoring should not fall on industry alone and suggested that public subsidies be considered to support these information gathering efforts. If industry provides access to sites, scientists from other areas can conduct studies and take on some of the financial burden. There is a need to know what we are mitigating for and adaptive management would help clarify this question. Ms. Rader concluded the discussions by saying that she is not saying no to operation monitoring across the board, but if there is great certainty that impacts are low, operations monitoring may not be necessary.

3. *What criteria should be established for using pre-existing information for impact determinations, including deciding if a categorical exemption is appropriate?*

In the interest of time the group moved on the next series of presentations before specifically addressing this question. It was noted that the group would strive to cycle back to this question after the next round of presentations or at the end of the day during the open discussion session.

IV. Kinds of Impacts

A. Scott Flint, CDFG [3]

Mr. Flint shared his thoughts and perspectives on the types of impacts to consider when siting a wind project. The groups' attention was then turned to the following discussion questions.

B. Discussion Questions

4. *How much discussion should the guidelines include about impacts due to habitat loss?*

Ms. Sanders noted that every project addresses habitat loss but requested the group provide their perspective(s) on how much direction needs to be included in the guidelines. Mr. Bloom replied that certain species of special concern, in particular nesting birds of prey, are not given a whole lot of review (e.g., Loggerhead Shrikes and others in arid environments) and there are potential areas where a fair number of breeding pairs are being lost.

5. *How do the displacement and disturbance impacts due to wind energy development in California compare to other states and countries?*

Ms. Spiegel replied that it is uncertain if this question can be answered as she did not think displacement and disturbance impacts had been studied in California. Mr. Linehan agreed that he could not answer this question with respect to California either but stated there are studies in other relevant habitats (e.g., Oregon's statewide study, grasslands habitat and Washington's CEQA-equivalent process, Idaho and mid-west studies on prairie and sage grouse) that may help. As such, there ought to be some review of existing studies to help inform an approach for California.

6. *What are the necessary steps to develop a cumulative impact analysis and what should the scope of that analysis be?*

Ms. Sanders elaborated on this question asking how much guidance should be provided, such as a step-by-step process for conducting cumulative impact analyses or a generic reference to CEQA requirements. She noted that cumulative impacts play into compensatory mitigation and mitigation

[3] A copy of this presentation can be found on the CEC website at http://www.energy.ca.gov/renewables/06-OII-1.

in general. Ms. Mudge concurred that this is the hard part of CEQA as cumulative impact analyses must be conducted as part of an Environmental Impact Report (EIR). Assuming the threshold for requiring an EIR is tripped some guidance would be helpful. It is not an easy exercise to extrapolate wildlife impacts from the various factors related to the megawatt capacity of each project but some geographic boundaries could make sense. Ms. Mudge expressed the hope that policy will take common sense into account so that not every project would be deemed to have cumulative impacts; avoiding the scenario where every project is flipped into the EIR zone. If this scenario was not avoided it would preclude the goal of streamlining the process. Ms. Mudge proposed that certain classes of projects could be deemed not to have cumulatively considerable impacts or could mitigate to avoid this classification.

Mr. Stein noted that CEQA requires that CDFG review projects in the application phase. If a programmatic EIR were developed for a wind resource area (WRA) it would be easier to get a handle on cumulative impacts. Ms. Mudge concurred and added that other projects could then tier off the programmatic EIR; looking at the big picture WRA could preclude smaller sections redoing evaluations. She added that it could be helpful to identify areas the counties indicate are likely to be zoned, developed and/or built within a WRA and plan for the development of these areas with some slated as being diminutive enough to not require cumulative impact analyses.

Mr. Flint responded that while it is a difficult issue to address and CDFG does not have all the answers, they are doing the best they can to formalize an approach since lawsuits can effectively halt wind development projects. CDFG is currently seeking input from stakeholders as much as they are offering their own thoughts on these matters. Mr. Flint added that it is essential to include something about the issue of cumulative impact analyses in the guidelines for them to be considered complete.

Joe Vincenty of CDFG added that all reasonably foreseeable projects (e.g., wind, residential development, etc.) should be considered when analyzing cumulative impacts but it is important to find some middle ground as to how far to extend the scope of the analyses in any one project area.

Ms. Sanders stated the guidelines do not currently say much about programmatic analyses. She noted that while there are advantages to a regional comprehensive approach there are also disadvantages when subsequent analyses do not happen on a site-specific basis. Mr. Linehan replied that CEQA has to work no matter how you approach it and local lead agencies have a responsibility to ensure site-specific analyses are appropriately tiered off a programmatic EIR. If not, these projects are vulnerable to litigation/appeal. He also noted that programmatic EIRs take time and money to complete therefore they should be focused on areas slated for major wind growth.

Ms. Mudge clarified that projects can tier off a programmatic EIR and where certain unexpected site-specific issue(s) arise they can be captured in a negative declaration. Ms. Sanders noted that negative declarations do not have the same level of effort invested up front often leading to deficient analyses. Ms. Mudge agreed that it is possible, but if so, the programmatic EIR was not a good one. WRAs are not so vast that you cannot do a reasonably good job at assessing cumulative impacts and identifying a suite of mitigation measures each project would have to adhere to.

Mr. Stein added that the purpose of a programmatic EIR (such as the Bureau of Land Management's (BLM) for wind development on BLM lands) is to streamline the process for other projects. If they are not set up for this purpose, Mr. Stein wondered why anyone would bother doing them at all. Ms. LeMay stated her opinion that programmatic EIRs should not hold up other wind project developments; if developing a programmatic EIR becomes a requirement before a project can be addressed by a lead agency it would create significant challenges to industry. While

she is in favor of programmatic EIRs, Ms. LeMay does not believe the guidelines should address them as it implies programmatic EIRs should exist for all areas and could set a precedent for future projects to be delayed without a programmatic EIR in place. Ms. Rader suggested the guidelines will likely say you need x, y and z information about a site and therefore a programmatic EIR could be listed as one way to meet the demand for information.

There was some discussion about whether or not cumulative impacts could be evaluated without a programmatic EIR as the goal is to look at projects from a 'big-picture' perspective. It was noted that individual EIRs are required to look at cumulative impacts although they are typically not as detailed on a site-by-site basis and there is not as much effort to create standardization. The question was raised of how to ensure mitigation measures (pre- and post-construction) translate from programmatic EIRs to negative declarations at the same level of complexity and detail. Ms. Mudge proposed that a programmatic EIR should contain prescriptions for mitigation measures for projects that tier off the programmatic EIR.

V. Impact Assessment

A. Presentation – *Dick Anderson* [4]

Mr. Anderson prefaced his presentation by stating that we do not have all the answers right now but we will know when we do because there will not be as many questions remaining nor as much controversy surrounding the topic. Most states are looking for consistency in standards and we are doing our best to do the same to ensure the guidelines will be a useful tool.

After the presentation, Mr. De Morgan encouraged general comments and clarifying questions. Ms. Rader stated that the Bonneville Power Administration (BPA) study was considered to be good and allowed for a great deal of correlation that was statistically valid. Mr. Anderson replied that although he was not very familiar with this particular study there is a great deal more information available now.

Mr. Linehan informed the group that when his company goes out to a new site, 20-minute point count surveys are typically conducted to create a benchmark for comparison against other sites within the same region or across the country. In new areas with fewer region-specific characteristics existing information is used but with some uncertainty. Mortality predictions should be able to be applied to new sites in the future with greater confidence as new data will help refine models so their predictions become more useful.

Ms. Mudge inquired if the group had any thoughts about how risk assessment (low, medium, high) translates into CEQA significance. Mr. Anderson replied that as findings may vary depending on the context within which information is evaluated a defense of determinations should be required.

Ms. Hogan alerted the group that the NWCC November meeting would provide an opportunity to discuss papers describing risk assessment for bats. There is a lot of work being done but in the short term projects will have to be developed using risk assessment models, with actual impacts evaluated post-construction and compared to risk assessment determinations. There is not enough mortality data available to correlate between sites so all data from all projects should be combined/pooled to create a body of knowledge. This body of knowledge can eventually be used to conduct 'true' risk assessments.

[4] A copy of this presentation can be found on the CEC website at http://www.energy.ca.gov/renewables/06-OII-1.

In response to a request for clarification on how to define meta-analysis, Mr. Anderson replied that a meta-analysis would look at all comparable projects and try to make sense of bird use and mortality information. Every time a new study was conducted, the data would be added to the meta-analysis bundle and used to compare site-specific pre-permitting and operations monitoring data as well as on a project-to-project basis.

Providing an example for consideration, Mr. Linehan noted that BPA funded a study to determine the appropriate number of seasons for pre-permitting monitoring. Findings indicated that spring was a pretty good indicator of bird use throughout the year. While this is a simplified analysis it was a good start for a big picture predication of annual bird use. Ms. Rader raised the question of whether CEC could secure sufficient funding to conduct a meta-analysis. Mr. Anderson provided a best guess estimate that the costs could be less than $100,000. Mr. Linehan noted it depends on what you want to answer. Robert Thresher of the National Renewable Energy Laboratory added that the meta-analysis would be relatively inexpensive as it is essentially be a desk exercise of looking at all existing data and trying to get at statistical indicators; conducting individual studies is what is costly.

Ms. LeMay commented that there are some examples of pre-permitting and operations correlation factor efforts occurring in Solano County that will be completed soon. The more thorough studies are conducted now, the more certainty we will have in the future especially for a meta-analysis.

B. Discussion Questions

7. How much detail should the guidelines provide on risk assessment protocol (e.g., should the guidelines specify how to develop a collision risk estimate)?

Marcia Wolfe of M.H. Wolfe and Associates Environmental Consulting responded that she is concerned about a cookbook approach and suggested the guidelines should specify some factors without making it rigid.

Mike Best of Pacific Gas & Electric noted that there is a good study on assessing risk for avian mortality conducted by the Power Line Interaction Committee. While it is specific to power line collisions, it has general qualifiers to assess risk (e.g. habitat, etc.) and could be referenced as a similar model. Ms. LeMay suggested including standardized elements such as characterizing bird use within the rotor-swept area with a formula (if possible) such as the number of birds per MW per year.

Mr. Stein stated the importance of defining how existing operations' mortality data should be used in defining risk for new projects or mentioning that risk assessments should be guided by existing data to the greatest extent possible. Ms. Rader added that the guidelines should also recognize that there are statistically valid ways to correlate existing data to sites and indicate what sources of data would be valid.

Dr. Thresher noted that the National Academy of Science has a study group that is looking at East Coast wind sites to assess risk and project mortality; the study results are due in December 2006. Given that risk is dependent on species and habitat, there is no validated "risk" model as there is not enough data and the limited data that does exist comes from too few places. Bird avoidance is currently not quantified so it is uncertain how much of a role this plays. It is possible to get very general indications at this point in time; we should start with these rough estimates and refine results through meta-studies by grouping data and sorting out issues.

Ms. Hogan replied that the guidelines should create a placeholder for now as things may change as more information is collected. The guidelines should direct counties to the 'research needs' chapter to help in filling in the gaps. Mr. Stein reminded the group that it is important to ensure that the guidelines' directives to industry serve the purpose of defining risk by linking assessments through consistent pre-permitting and operations monitoring protocols.

8. *What kind of data from other studies could be included in the guidelines to assist in evaluating potential impacts (e.g., a table showing flight-height data or fatality estimates for collision susceptible species from other studies)?*

Chris White of Oak Creek Energy Systems inquired if data (studies, maps, tables) could be made accessible to the public and available to industry for peer review. He suggested reducing the duplication of data if possible to conserve resources. Ms. Ward replied that CEC has been talking with the CDFG bio-geographic data branch and noted it could be possible to schedule a discussion with CDFG staff on this topic if there was sufficient interest from stakeholders. The group expressed significant interest in further discussing ways to share existing data and how to make it publicly available. It was agreed that this topic would be covered at a subsequent staff workshop.

Mr. Linehan commented that it may be useful to include NWCC national numbers as benchmarks for further monitoring and mitigation. While there is still a need to develop numbers for California this could be a good starting place.

Ms. LeMay added that any available and acceptable information stating what industry does not have to worry about (e.g., ruling out certain species that are not prone to collisions) would be helpful. Mr. White noted that updating information becomes very important and introduces some uncertainty. Ms. Ward replied that the California Natural Diversity Database indicates relative vulnerability of species and prioritize updates for sensitive species. Mr. Stein suggested that CEC and CDFG should resist including data in the guidelines as it would get stale very quickly. Rather, sources of data (NWCC or CEC-PIER web site) should be referenced instead. Dr. Thresher countered that if a programmatic EIR was developed for a WRA this data could be published in a report detailing what species are present and what species are likely not. This would be a good benchmark reference on a site-specific basis.

Linda White of Kern Wind Energy Association suggested looking to the military for data on bird and aircraft collisions. Ms. Rader reminded the group that Jim Newman suggested we think carefully about the purpose of database to ensure that publicly available information is not misused.

3. *What criteria should be established for using pre-existing information for impact determinations, including deciding if a categorical exemption is appropriate?*

The group's attention was turned back to this question, originally introduced during the previous CEQA context discussions. Ms. Rader responded that determinations need to be scientifically and statistically defensible for the site in question.

Ms. Sanders inquired about the group's thoughts on what kind of data could be considered adequate to apply to new, adjacent projects. Mr. Linehan replied that clear similarities of habitat (e.g., vegetative cover, topography, species present) should be evaluated when determining if data is applicable. He noted that it is hard to create firm rules but the questions asked can be consistent. Mr. Stein agreed, and mentioned that CDFG said data from an adjacent site could not be used if turbines were a different height. He expressed the hope this is not the case as it should be possible

to extrapolate data given similar types of turbines with similar heights and blade lengths (even if not the exact same model).

Ms. Ward addressed the currency of data, stating that CDFG Timber Harvest Plan survey guidelines indicate five years is the maximum and asking the group if a similar number should be included in the guidelines. Ms. Rader indicated that a number would not be appropriate as some information on migratory patterns and species occurrence could still be useful if it validated that conditions were the same even if the data itself was not current.

Ms. Wolfe encouraged the group to remember that it is not only on-site habitat that influences species density, but that adjacent habitat must be considered as well. If you can validate that data is still applicable it should be used, but there needs to be some criteria established to evaluate its usefulness.

Mr. Anderson agreed and noted that regardless of whether or not the guidelines indicate a number or not, all information needs to be defensible. For example a one-year-old study may be considered current but may not be useful if it is done poorly.

9. *How much analysis should pre-permitting studies include on potential risk to populations due to wind energy development?*

Ms. Hogan informed the group that work is being done using genetic data from sample bats killed at wind farms. The goal is to look at population dynamics in order to make some statement about impacts from particular wind farms on populations of bats.

Ms. Vance added that for an adequate CEQA impact analysis CDFG would want to know if significant population-level impact(s) were occurring during the pre-permitting stage.

10. *How should Ecological Risk Assessment be used to evaluate potential impacts to bird and bat populations?*

Mr. Anderson clarified that an ecological risk assessment is a framework for identifying risk regarding the level(s) of impact. At this time we cannot make credible guesses about the risk of impacts at wind turbines to certain species as we need to tease out finer details and relationships to determine these impacts.

Ms. LeMay wondered how the ecological risk assessment differs from what is commonly understood as a "generic" risk assessment. Dr. Thresher replied that NWCC wrote a paper on ecological risk assessments based on the Environmental Protection Agency's ecological risk assessment model. The draft paper is currently posted on the NWCC web site (http://www.nationalwind.org/) and provides a rough but good idea of what the framework is defining. He noted the NWCC is meeting in November 2006 to determine how applicable the framework is and how it can be applied to birds. Mr. Anderson commented that the NWCC draft paper talks about making use of standard metrics and methods. It was noted that the Clean Energy States Alliance also attached the white paper to their written comments which is docketed on the CEC website as well (http://www.energy.ca.gov/renewables/06-OII-1).

VI. Guideline Revisions

A. Presentation – *Misa Ward and Scott Flint*

Ms. Ward stated that the presentation was focused on sharing (CEC and CDFG) internal thoughts on a guidelines revision process. The intention is to let the guidelines play out with on-the-ground projects to allow for sufficient use and meaningful feedback. The guidelines will not be considered "done" when they are released, rather it will be a living document that undergoes periodic revisions.

Mr. Flint added that workshop discussions raised concerns about study results coming in very soon and indicated that this new information may need to be incorporated if possible. Any numbers that are included in the guidelines may need to change and there is some concern that it appears these numbers may change quite rapidly. The revision process will be a very important aspect of ensuring the guidelines are current and useful.

Ms. Ward informed the group that the Integrated Energy Policy Report (IEPR), which provides summaries and recommendations on various energy issues, first identified avian issues and inspired the guidelines process in the first place. The Environmental Performance Report focuses on evaluating key environmental areas and identified issues are moved to the IEPR as needed. It could be possible to take advantage of these existing cycles for a joint CDFG-CEC revision process if appropriate.

B. Discussion Questions

11. *What type of ongoing forum would be useful to receive comments/suggestions to improve survey protocols and mitigation recommendations?*

12. *How should knowledge advances from PIER research be incorporated into revised guidelines?*

Ms. Rader replied that there is no doubt the guidelines will need to be updated at some point, but the focus should be on principles that allow for some flexibility and will stand the test of time. Mr. Linehan commented that suggestions for a revision process may be dependant on seeing the first draft. He suggested it could be useful for CEC and CDFG to convene a one-day (informal) annual seminar to review new information from mortality studies produced by industry and others and gather feedback regarding real-time application of the guidelines.

Mr. Stein proposed that rather than instituting a rigid schedule, an annual assessment to determine if there is a need to revise would be more efficient. While he did not have ideas for criteria to make this decision, he suggested CDFG and CEC could make determinations based on stakeholder input.

Ms. LeMay encouraged the group to be realistic in that it is taking over a year to develop the guidelines in the first place therefore revisions will likely take a great deal of time as well. It is possible a five-year cycle could be appropriate for major overhauls of the guidelines.

Greg Blue of EnXco suggested that the guidelines need to be in place for several years before revising and built-in flexibility will be essential to adapt to developing laws. Mr. Blue stated that changes will need to occur in a formal process and the IEPR process would be a good place to do so. Ms. Wolfe added that the guidelines are guidelines <u>not</u> regulations and it is impossible to guarantee that every project will fit the mold. A process for variance, exception and negotiated agreements between agencies and industry is critical to creating effective guidelines.

Ms. Hogan agreed that major revisions should occur no sooner than five years after initial implementation but there should be an annual assessment to review new data and determine what in the guidelines could be tweaked. She suggested that perhaps a general framework could be included in the guidelines to link/point to where new data will be stored.

Ms. White proposed that CEC and/or CDFG could have a comment section on the web to track feedback in timely manner. Ms. Rader mentioned that the NWCC website would be a good place to link to new data. Ms. Wolfe suggested the use of adaptive management would be a site-specific way to adapt as new information becomes available.

Dr. Thresher shared an example of a similar situation when an international design wind turbine standard was first being established. The standard was being developed before all data needed was available. It took two to three years to put the standard together and about the same for updates to be incorporated. It included a disclaimer that exceptions could be demonstrated as valid by putting some sideboards on how to determine the validity of information (e.g., peer review process).

VII. Open Discussion

The group had the opportunity to engage in an open discussion for the remainder of the afternoon. Mr. De Morgan encouraged participants to raise any topics that had not yet been covered or that required additional attention. Paul Vercruyssen of the Center for Energy Efficiency and Renewable Technologies (CEERT) raised the issue of risk assessment being a difficult concept to master and use effectively and expressed the concern that it was still unclear how it should be addressed in the guidelines. Mr. Anderson responded that there could be a discussion about the concept of risk assessments included in the guidelines but acknowledged that CEC and CDFG are not ready to include a prescription for how to do it. It is important to be clear that the guidelines should not recommend anything that is speculative at this point in time. It was noted that there is no formula in existence to separate out risk assessments from impact assessments. Ms. Sanders agreed that the lack of such a formula has been difficult in drafting the guidelines because no one wants to advocate for anything that has not been tested.

Ms. Rader stated that while the concept of risk assessment is in its infancy right now, providing a link to NWCC would be appropriate because that is where the current body of knowledge will be expanded upon. Ms. Spiegel noted that NWCC is working on the development of standard protocols and metrics which will help get to the answers being sought. Mr. Flint added that he had worked with this concept for a number of years and that a (ecological) risk assessment methodology model does exist. This model includes a reasonable mesh of qualitative and quantitative assessments and attempts to frame and address uncertainties.

Ms. LeMay inquired about CDFG's perspective on what other industries have done to assess avian impacts; noting that the Avian Power Line Interaction Committee (APLIC) is one tool but wondering what else is out there. She also requested some insight regarding CDFG having to make decisions with a lack of information. Mr. Flint responded that CDFG is trying to create a programmatic response to cover activities and impacts and ensure wildlife protection while minimizing the industry notification process using a habitat conservation approach. As far as collision impacts are concerned, CDFG always discusses them in comments (related to sensitive areas, migratory routes, buildings etc.) in CEQA analyses and suggests modifications to reduce impacts as possible. CDFG is also working with at least one utility to draft a Memorandum of Understanding regarding collisions and Mr. Flint noted the utility is taking on a great deal of the burden to determine ways to reduce impacts and ensure compliance.

Ms. Le May asked what requirements exist for industry regarding operations monitoring for buildings and airborne collisions. Mr. Flint replied that if an avoidance measure were incorporated CDFG would suggest some attempt to monitor to determine if the measure is effective or not. Ms. Vance added that at the Kesterson selenium settling ponds in the San Joaquin Valley annual monitoring of birds is required, including evaluations of nesting success. Annual reports are produced and there are mechanisms for management changes and/or additional mitigation as needed in response to the annual report. At this time there is no termination date for monitoring due to on-going takings of birds.

In response to a question about airports, Mr. Flint stated that many airports are military and birds are at risk from take-off and landing therefore it is not a good example to compare. He noted the Department of Corrections operates lethal electric fences that kill listed birds and that 27 prisons are currently in a HCP permit situation. The process requires quarterly monitoring (collection of carcasses) and reporting and includes strict take limits that are re-set every five years. There are three tiers of corrective actions established to alleviate an episode, as well as a range of mitigation options.

Ms. Rader inquired if a similar process was in place for communication towers. Ms. Vance replied that CDFG does ask for monitoring and risk assessments if the towers are located adjacent to or on wetlands. This is a very site-specific situation and while no specific guidelines have been written, there are a series of options to consider based on known information and species that use the site in question.

Mr. Linehan expressed his opinion that other industries do not appear to be held to the same standards as the wind industry. When sensitive species are present it is accepted that industry needs to go the distance, but what if there are no sensitive species present? Wind industry appears to be held to general wildlife standards that would affect all migratory birds rather than just specific species present. An avian protection plan could be the place for detailing 'best practices' used in siting and developing wind projects. This could promote a self-certification program where and industry could manage projects while assuring some protection under game laws.

Mr. Flint clarified that he is not involved in listing of sensitive species specifically but can comment generally on the topic. There are two levels of review; updating information and making an assessment about whether more review is warranted. This is followed by a one-year study period (funded by CDFG) to update the data set. Ms. Vance added that CEQA data quality and quantity varies across the board. Impacts may be generally accepted even if not quantifiable, but if a negative declaration occurs impacts must be quantified. Species listing determinations are easier to deal with, as there may be a good deal of information for a single species due to interest in that species' decline. With respect to the wind industry it is very difficult to make an informed decision when you are looking at potentially 300 species. Mr. Flint noted that the significance of effects varies due to site-specific conditions and information varies by species and site. Therefore we are often dependent on the good will of industry and the applicant. CDFG considers available information to make reasonable expert judgments based on facts in making determinations. There are times when it is a "best guess" situation, but CDFG tries to err on the side of resource protection and to triage situations by looking at the most sensitive areas and species.

Ms. LeMay indicated she did not know what everyone else faces, but given that we are inventing something, there must be other ways to think about this issue. It is important to consider what is already being done (e.g., species listing 90-day review period followed by a one-year study). Ms. Murray added that there is value in creating a programmatic EIR to take a comprehensive look at (cumulative) impacts and biodiversity. Ms. Mudge cautioned the group to keep in mind that the

process for listing species is very different than determining if a wind site will have significant biological impacts.

Mr. Flint indicated that the rigor of operations monitoring could not simply be correlated with the expected level of impacts indicated in pre-permitting monitoring results as sufficient time is needed to verify assumptions. CDFG wants to know if impacts are avoided and/or minimized effectively and if the assumptions can be validated. Ms. Wolfe commented that if (mortality) numbers were low it would take longer to validate them. Mr. Vercruyssen noted this creates a disincentive for low-impact projects.

Mr. Linehan responded that sample size is important; and you need to look at the question(s) being asked. If low impacts are expected and you just want to verify this, low-level monitoring for a few years should be sufficient. If you want to correlate mortality with turbine type the cost and monitoring investment increase significantly. Mr. Linehan suggested industry could simply confirm that assumptions are correct with a low-level investment in monitoring and ramp up efforts only if needed. Ms. Sanders noted that it is not the level of impact that dictates investment but uncertainty.

Mr. Anderson concluded the discussion by stating that if a statistical analysis was conducted where (mortality) numbers were low it would have to be done for a longer period of time, but no one is saying that low impact sites would need to do more monitoring. If a project is "green lighted" with some uncertainty, there will need to be some monitoring conducted to prove that it has low impact. If there is little uncertainty, there would not be a need for a very large investment in monitoring.

Thursday, September 28, 2006

I. Introductions and Agenda Review

Mr. De Morgan provided an overview of the day's agenda and meeting objectives. He then initiated a round of introductions for the benefit of new attendees and moved the group to the first agenda topic.

II. Turbine Design and Avoidance/Minimization Opportunities

A. Presentation – *Robert Thresher, National Research Energy Laboratory* [5]

Dr. Thresher prefaced his presentation by stating the consumption of coal-based energy is increasing as is the planned expansion of coal plants over the next 10 years to meet this increase in demand. The U.S. trails Europe in wind production; Denmark currently gets 20% of their energy from wind. Therefore the recent White House directive to increase wind energy production 20% by 2020-2030 is facing a management issue rather than a technology issue. He also noted that wind production occurs in the center regions of the country but most people live on the coastlines thereby creating a transmission challenge as well. Dr. Thresher then presented a great deal of technical information related to turbine design and related opportunities for avoidance and/or minimization of impacts to birds and bats.

[5] A copy of this presentation can be found on the CEC website at http://www.energy.ca.gov/renewables/06-OII-1.

A participant noted that birds also strike stationary objects, raising the issue of whether or not such impacts could be avoided. Dr. Thresher agreed but countered that the risk of strikes can be reduced dramatically with improved turbine design.

The question of costs associated with conducting a radar study was raised. Dr. Thresher replied it costs $400,000 to collect a complete year of data for one radar unit (measuring both horizontal and vertical positions.) The offshore study referenced in the presentation is a little fancier as two radar units were used. Dr. Thresher summarized that the guideline development process is creating a list of helpful information being collected but that there is a need to know the costs associated with such studies. Given that part of CEQA assessments focuses on feasibility, if the guidelines suggest certain protocols industry and lead agencies need to know cost parameters for practical applications on the ground.

With respect to the percentage of the NREL budget spent on developing technology versus mitigation approaches, Dr. Thresher informed the group that due to budget cuts NREL is currently funding a moderate level of studies. These studies were deemed to be unnecessary as the issue of avian risk was perceived to be going away. He noted that NREL is also funding some collaborative studies (for sage grouse and other ground mating birds) but overall the funding is limited.

Ms. Dorin asked how much taller the footings would need to be if the turbine blade length was extended to 100 meters. Dr. Thresher replied they would need to be 70-100 meters depending on site advantages. Although it is not necessary to automatically increase height to accommodate increased blade length you ultimately need to keep the blades off the ground.

Mr. Vercruyssen wondered if the calculations for the "stick bird" model produced results regarding what can be done to improve risk factors. Dr. Thresher responded that all models are wrong but some are useful. The "stick bird" model is useful for insight and tells you what parameters to look at but does not provide answers regarding fatality avoidance approaches and/or technology. He did note that the ratio of revolutions-per-minute (RPM) appears to be a key factor in avoiding strikes.

Mr. Stein posed the question of whether different impacts could be expected from different manufacturers of turbines. FPL Energy is currently working in Solano County and had hoped to put new turbines (Vestas 128) right next to a current project site. CDFG said impacts at the new site could not be extrapolated from monitoring results at the existing site because new technology may have different impacts. Other than a different blade length, Mr. Stein inquired if there is any reason why this would be the case. Dr. Thresher responded that key factors affecting impacts are RPM, rotor-swept area and operation hours. It should be possible to scale the new area with the existing area if all other factors are the same. He added that if flight paths were known tower/blade height could be adjusted to minimize risk. Mr. Sterner noted that operational time would be increased for newer turbines and blades could cut in at a lower wind speed.

Mr. Vincenty wondered if it was possible that bats chase the turbine blades or if turbulence from the blades could suck in insects which then attract bats. Dr. Thresher responded that there tends to be a collection of bug carcasses on the leading edges of blades and this may act as an attractant. He also noted that bats are curious animals by nature. Additionally, there has been some exploration using ultrasound to see if turbines may be emitting sounds that attract insects and/or bats. Initial results do not appear to confirm this but a report is due out at the November NWCC symposium. There are also a series of hypotheses regarding possible attractants; the simplest being that turbines are located in clearings where insects congregate, and bats fly into the rotors when chasing the bugs. Garry George of the Los Angeles Audubon Society wondered if this phenomenon could be observed in pre-permitting studies. Mr. Linehan replied that Castleton and Husac sites are currently

testing this hypothesis using AnaBats at the hub level and that other sites are being recruited to test this approach and evaluate if it is a good predictive tool. Ms. Sanders noted that Jon Belak of EDM International is doing the same at the Black Mountain Wind Energy Project in Plumas County. Mr. Linehan inquired if these studies were being done in cooperation with Bat Conservation International and suggested he would try to contact Mr. Belak to get more information.

B. Discussion Questions

1. *What evidence do we have that the new, larger turbines reduce collision impacts to raptors compared to old turbines? To resident/migratory songbirds? To resident/migratory bats?*

Mr. Linehan inquired if CDFG had any comments on this topic after reviewing operations monitoring results from the High Winds site in Montezuma Hills, Solano County. This site has high raptor/bird use (second in the state to Altamont), but is showing low mortality. Mr. Linehan wondered if this could be due to a technology-based change. Mr. Stein added that Diablo Winds is the only repowering in Altamont with bigger turbines. Operations monitoring is being conducted and it appears that the overall number of mortalities decreased, save for red tailed mortality which increased. Ms. Rader indicated that there is no clear comparison for this information but in general the mortality numbers were low.

Ms. Levin interjected that for the purposes of the guidelines, numbers are not as important as determining how much information/many studies are needed, as well as what kinds of studies to conduct and how to compare results when site features are so diverse. She added that the focus should be on setting general parameters for studies within the guidelines. Mr. George added that it would be helpful to know what would trigger raptor versus migratory songbird studies given that very little information for migratory songbirds is available. Ms. Levin responded that while no one wants to conduct operations monitoring studies in perpetuity, it should be clearly defined in the guidelines what level of investment would be appropriate for the next two to five years given the current lack of data available.

Mr. Linehan agreed there is a need to do operations monitoring, especially at sites where studies have not been conducted to establish track records for different regions. Passerine migration studies should be initiated based on evidence of impacts only if indicated in operations monitoring results. Ms. Levin suggested the guidelines could address how to do good operations monitoring surveys for passerine mortality. Mr. George informed the group that the only study of nocturnal migratory songbirds in California was conducted at San Gorgonio in 1981. The recommendations arising from this study include: 1) using (nocturnal) NEXRAD radar before and after migrations to then compare the results; and 2) limiting turbine height to 127 meters due to the flight height of nocturnal migrating passerines.

Mr. Bloom expressed the hope that increased turbine height would reduce avian mortality but was concerned that it would not reduce the impact by much. The two most commonly killed species are the Golden Eagle and the Red-tail Hawk which tend to fly at 60-600 feet. He noted Burrowing Owl mortality will likely be reduced with increased turbine height.

2. *What elements of turbine design/siting can be changed during the pre-permitting phase of development to reduce predicted impacts to birds and bats?*

Ms. Dorin offered that some operations monitoring results report good figures about where kills are happening. She asked if this information is used in adjusting upcoming phases of projects and if so, what specific information influences the attributes of turbines. Mr. Stein replied that industry tries to

adjust plans to ensure the best design and siting of new developments. Mr. Linehan added that it is very difficult to tease out influences and factors but general concepts are known such as avoiding bodies of water and locating sites away from prominent rims and cliffs.

There was some discussion about how to quantify 'high' mortality for bats. Ms. Levin commented that given the extent of unknowns related to bat mortality and significance of impacts, these detailed conversations were not particularly helpful to the development of the guidelines.

Ms. Vance noted that as bats are long-lived and have low reproduction rates they cannot be compared to other species when assessing significance of impacts. There are also specific habitat requirements for different species which could influence extent of impact. She reminded the group that Betsy Bolster of CDFG shared information through written comments which may help assess significance of impacts to bats. Mr. Anderson added that there is a need for comprehensive, defensible information and that a meta-analysis could provide data for all stakeholders to refer to and use.

3. *Are there examples (other than Foote Creek, WY) where information about site characteristics influenced turbine siting?*

4. *What kinds of Best Management Practices, general guidance on turbine siting/design, and other generic avoidance measures have been useful on past projects and should be included in the guidelines?*

In the interest if time, the group agreed to cycle back to these questions during the afternoon's open discussion session or through written comments as appropriate.

III. Mitigation

A. Presentation: Opportunities for Avoiding, Minimizing and Mitigating Wind Power Development Impacts on Wildlife – *Dick Anderson, CEC*[6]

B. Discussion Questions

Before attention was turned to the specific discussion questions the group engaged in general conversations. Ms. Levin disagreed with the concept of blending avoidance, minimization and mitigation. The take of birds and bats is different from other familiar situations where take is mostly due to impacts to habitat rather than mortality. For these kinds of situations, off-site mitigation measures are appropriate. It is not appropriate to mitigate off-site for actual, direct takes (mortality) as an equivalence factor is non-existent. The guidelines should indicate a higher premium on avoidance measures, with adjustments being made on-site to minimize the remaining impacts that cannot be avoided. Ms. Vance noted that CESA requires that for the take of sensitive species off-site mitigation must improve habitat to be certain you can get equal numbers of 'replacements' as a result.

Mr. Best informed the group that in the late 1980s the Avian Power Line Interaction Committee (APLIC) considered similar questions about how to make facilities bird safe. There have been many versions of their voluntary guidelines and a 2006 version is due out soon (see http://www.aplic.org/). While there is not an exact translation of substance, it could be a good template for these CEC guidelines.

[6] A copy of this presentation can be found on the CEC website at http://www.energy.ca.gov/renewables/06-OII-1.

Ms. Levin proposed that consideration be given to establishing a statewide fund to help agencies look at experimental mitigation measures; especially given that property values are so expensive that off-site compensation appears to be cost prohibitive. Ms. Vance replied that putting money into a fund does not constitute mitigation unless you can ensure something would happen on the ground to help the species. She also raised the concern that without any one individual/entity being responsible for the fund it would be difficult to ensure the money is utilized appropriately and in a timely manner. In past workshops, stakeholders raised the idea of a fund set up to support research in building a meta-analysis as well. CDFG has to work with existing statutes in considering whether or not a fund is feasible. Mr. Vercruyssen elaborated that he was thinking of a fund for pooled-risk mitigation research to explore the viability of experimental options. This approach could possibly provide more answers faster than traditional methods. The research could be conducted on many sites, with many agencies/organizations supporting the effort to evaluate a full range of mitigation strategies.

Mr. Bloom mentioned that some impacts will not be known until problems are identified post-construction. The only mitigation that could compensate for golden eagle mortalities would be land acquisition, although he agreed that purchasing land in Altamont could not possibly compensate sufficiently. With respect to bat mortality, Mr. Bloom suggested purchasing an off-site easement relegated to a bat maternity roost in perpetuity. This could be a less-expensive strategy and could do something viable for the species. He suggested that a system for land acquisition could be developed through a co-operative agreement (e.g., Trust for Public Land, The Nature Conservancy) where money to purchase land could be set aside in a fund but would have to be used within two years.

Ms. Rader acknowledged the restrictions imposed by statutes but expressed the hope that known impacts to critical species could be mitigated creatively at lower cost and with greater impact. If 10 species were saved at the expense of impacting one species significantly perhaps the concept of species trading could apply as site changes may not be feasible in some cases. Given the uncertainty regarding bats, it seems to make sense to set up a research fund to understand impacts rather than expecting industry to try to assess impacts and initiate mitigation right now.

Arthur Unger of the Sierra Club's Kern-Kaweah Chapter stated that avoidance is critical and should be the priority. He expressed the hope that CEC and CDFG will keep the potential for significant impacts in mind while pursuing the White House directive of 20% expansion for wind development.

Rick York of the CEC Biology Unit noted that a coastal power plant applicant has to pay for wetlands habitat restoration at an adjacent property while also paying into a fund ($50,000 per year) to monitor the restoration efforts for the life of the power plant.

Ms. Rader stated that the seasonal shut-down at Altamont was an extraordinary measure in response to an extraordinary situation and has not been proven to be effective. She recommended that seasonal shut-downs not be included as an option in guidelines but that avoidance should be emphasized instead. Mr. George added that it is not possible to mitigate for disrupting a migratory pathway in any other way than with operational changes. He suggested that the guidelines may want to include a range of operational change options for classes of birds (e.g., raptors, migratory songbirds, etc.)

Ms. Dorin inquired what industry would recommend regarding adaptive management approaches. If turbines cannot be moved and seasonal shutdowns are not feasible, what other strategies exist outside of research/monitoring? Ms. LeMay responded that CEC and CDFG are the experts but

that generally industry would consider any other strategies that are quantifiable, reasonable and commensurate with the scale of a project's financial investment. The interest is to make these projects work, so the "what" and "how" are not as important. If access to sites and money are what is needed from industry to ensure mitigation is effective, industry could support that. Mr. Stein noted that adaptive management is problematic due to the price uncertainty. If a price tag could be put on adaptive management during the permitting stage it could possibly work. He added the caveat that if the range of options included a shut down of a project or moving turbines it could be too high of a risk to developers. Industry would prefer off-site mitigation instead (e.g., enhancement or conservation easement to help support populations elsewhere) given that best efforts to avoid impacts in the first place will have been taken. Ms. LeMay proposed the idea of a multi-phase approach for mitigation where developers set aside a limited amount of money up-front and a committee could decide what that money goes towards. Ms. Levin cautioned that group that in reality funds are not often used in a timely manner, if at all.

Ms. Dorin added that if adaptive management is being prescribed during the permitting stage it is not adaptive management. Ms. Vance concurred by stating that avoidance and mitigation are not the same thing. Offsite mitigation for project level impacts has to happen before projects become operational which allays concerns about delay. Mr. Vercryussen suggested that an agreement between regulatory agencies and developers could be negotiated on project-by-project basis; establishing a set amount of funding from developers up front, with regulatory agencies contributing funding to continue on-going monitoring/mitigation after the original funds have been used.

Ms. Levin inquired how far away off-site mitigation could be. Ms. Vance replied that it depends. Generally speaking, the closer to the site of impact the better but it depends on species, seasonal movements, critical habitat based on life history, and population structure and dynamics. Mr. Flint added that some species have population genetics and dynamics concerns that must be addressed, whereas for other species it is not as important. The historical mitigation policy of preference has been on-site/in-kind, off-site/in-kind etc., which is no longer applicable. Today the focus is shifting to whatever works for each situation. CDFG is compelled by statute to take action and we want to do that which will have the best results for species. Ms. Levin suggested that the guidelines include a list of entities that need to be involved in consultation for making trade-off decisions when off-site options are being considered.

Ms. Sanders requested stakeholders consider providing their perspectives in written comments regarding what tools are available for mitigation. CDFG wants to provide clear direction to counties on options to address unexpected problem if they arise.

5. *How can lead agencies establish an effective mechanism for implementing post-construction mitigation? (e.g., if a Technical Advisory Committee (TAC) is part of an adaptive management program, how are recommendations from the TAC translated into management action?)*

Mr. Linehan noted that his response applies to both questions #5 and #7. In the Northwest there is more of a focus on habitat loss and fragmentation and less on collision impacts given the assumption that siting is done well and mortality falls within an acceptable range (not including listed species) and industry has formulas for replacing habitat. If levels of bird impacts become too high a Technical Advisory Committee (membership predetermined) would be convened to review a menu of mitigation strategies/options. This menu includes options with known financial risk and does not usually include operational modifications, although operational modifications would be considered if extreme mortality was occurring. Potential off-site mitigation options could include supporting raptor rehabilitation programs, establishing raptor nesting offsite etc.

6. *Are there examples of successful implementation of seasonal shutdowns or other operational mitigation in reducing collision fatalities?*

Mr. George wondered if pre-permitting studies in California resulted in modifications of turbine structure or site design. Mr. Anderson replied that he was not sure, but by the time the permitting stage is reached the process is moving forward as is. In follow-up, Mr. George asked if modifications have been triggered by operations monitoring results. He suggested that knowing what has been done and how effective modifications have been could be helpful if included in the guidelines. Mr. Anderson noted that Altamont has produced a great deal of operations monitoring and adaptations have been implemented in response. Mr. Stein added that Diablo Winds looked at existing data and tried to place turbines thoughtfully. At High Winds, two years of pre-permitting data was considered but there was not much data you could pull from to inform turbine placement. In addition, operations monitoring data indicated there were no hot spots to make adjustments in response to.

7. *How can mitigation options be structured to provide: (a) some certainty for mitigation implementation, and (b) some certainty for financial risk for wind developers?*

8. *How much detail should the guidelines include on mitigation options? For example, should the guidelines provide suggested language for avoidance and compensatory mitigation that could be used by a lead agency in their permit conditions?*

The group agreed to address these questions during the 'Open Discussion' session towards the end of the day. Attention was then turned to the compensatory mitigation presentation.

IV. Compensatory Mitigation

Ms. Spiegel notified the group that a PIER scoping workshop, focused on the development of an avian wind energy research "roadmap," is scheduled for November 2, 2006. Stakeholders can subscribe to the PIER distribution list to receive formal notices on the CEC PIER web site (http://www.energy.ca.gov/pier/index.html). Ms. Spiegel noted that PIER does not fund mitigation or permitting requirements. Mr. Stein inquired if this protocol would be altered if a permit requirement demanded research. Ms Spiegel replied that it would not, but that research as part of monitoring would be possible. Mr. Anderson noted that there are numerous PIER programs; although each has some autonomy, in general they are not supposed to fund requirements developers are supposed to fulfill. Mr. Flint added that while there is a valid concern about funds sitting idle it is possible a funding system could be established in partnership with the Wildlife Conservation Board. This system may require legislation but should not be ruled out at this time.

A. Presentation: Compensatory Mitigation – *Scott Flint, CDFG*[7]

Mr. Flint prefaced his presentation by stating that while he does not have all the answers, he intended to present ideas that may work, as well as introduce some new ideas that need further consideration. He encouraged stakeholder feedback related to the evaluation of these new ideas.

[7] A copy of this presentation can be found on the CEC website at http://www.energy.ca.gov/renewables/06-OII-1.

B. Discussion Questions

9. How can guidelines provide guidance on determining the nexus between impacts and compensatory mitigation, and the amount of mitigation?

Ms. Rader inquired if money dedicated to research would count if impacts were unknown. Mr. Flint responded that he was not sure why it should not count. He suggested the consideration of joint funding to get the information needed to make good siting decisions but acknowledged that there are certain site-specific actions that developers must be held responsible for.

Mr. Flint suggested that a habitat approach to mitigation should focus on benefits for multiple species. For projects located in the desert, there is potential for impacts to occur not only to birds and bats but also to the Desert Tortoise and Mohave ground squirrel.

Ted James of Kern County Planning inquired how the guidelines could be developed to address listed species impacts given the lack of adequate information in existence. For CESA and ESA-listed species, an agency can say a project proponent does not have enough information to define a project nexus. This lack of sufficient information for listed species challenges the credibility of determinations. Additionally, scientists often do not agree on conclusions which complicate matters further. Ms. Levin replied that the precautionary principle leads to erring on the side of caution. If there is insufficient information available to be able to establish a nexus but the project still needs to move forward, we should do so cautiously. Ms. Rader added that especially for bats it is uncertain what can/should be done regarding mitigation, therefore industry should have a second best mitigation plan moving forward.

Ms. Vance noted that large-scale recovery panning approaches would be ideal but it cannot be done without having land use agencies on board. She expressed the hope that participants recognize this process as an opportunity to work together and develop a new approach.

Ms. Ward stated that the guidelines will address all impacted species, not only those that are listed (e.g., common native species and bats without status). In response to a question posed by Ms. Sanders regarding whether or not a laundry list would be helpful to counties, Mr. James informed the group that guidance documents which provide certainty are very helpful. He then asked about the threshold of mitigation the guidelines were intended to address, such as mitigation for CESA or the recovery of (listed) species. Project proponents likely just want to mitigate and would not see species recovery as their responsibility. Ms. Vance stated that recovery efforts for listed species are required by agencies so it is unclear if industry funding would be appropriate.

Ms. Sanders clarified that the guidelines would not indicate industry should invest in recovery efforts, but would focus on mitigating for impacts on a project basis and possibly a cumulative basis for industry as a whole. She noted that at this time CEC and CDFG are trying to sort out how further monitoring could influence future adaptations and what recommendations to include for meeting permitting obligations regarding unanticipated impacts and the subsequent mitigation required.

Mr. York informed the group that mitigation funds had been accepted for impacts to Kit Fox as part of the Metro Bakersfield HCP. Mr. James provided some perspective on how the funding program was working out as follows:

- Endowment(s) goes to CDFG and the Wildlife Conservation Board to use.
- State staffing changes have created problems and implementation is stalled.
- Approach is helpful to perpetual maintenance but has its challenges.

Ms. Vance noted that there is a provision in the permit that required mitigation to keep up with what is being permitted. Mr. James added that inflated land values require the County to set a market value for land; therefore the County has been considering raising mitigation fees as a result. Mr. York referred to the analogy of "it takes a village" concept. These are great ideas on paper but actual implementation can present a significant challenge.

10. *Should compensatory mitigation programs for wind energy be established on a county/regional/statewide level? How would such programs be administered?*

Ms. Levin suggested mitigation funding could be used for the preparation and implementation of recovery plans. The guidelines may not be able to provide certainty given the uncertainty that currently exists, but an extensive list of options could be provided; including the potential to work towards county/ regional/state-wide processes.

Mr. Bloom proposed that since birds and bats are of the greatest concern and they roam the entire state, the guidelines should state concerns and the need for both State and Federal involvement. Ms. Spiegel informed the group that during siting stages, off-site compensation has been common. A third party, the Center for Natural Land Management, was brought in to apply its formula in calculating appropriate acquisition of land as well as for management of the land in perpetuity.

11. *When is it acceptable for compensatory mitigation to include an option for contributing to a research fund?*

Mr. James stated that at a local level, adoption of programs requires an adequate nexus and a research arena nexus becomes nebulous. Mr. Bloom proposed that satellite transmitters be used on resident birds of prey and their young on the first few years post-construction. This approach borders on research but could be deemed as monitoring and factor into compensatory mitigation.

12. *What compensatory mitigation models (e.g., wetland or endangered species mitigation banks) would be appropriate for wind energy mitigation?*

Mr Stein replied that the idea of a mitigation bank could be good. If an existing organization has land (which is good raptor habitat) in a bank, industry could purchase credits in that bank as mitigation if the price per acre is known. This could provide geographic flexibility for off-site mitigation and/or banking. Given the migratory nature of birds and bats, mitigation should be extended to the extents of their ranges.

Ms. Levin agreed that a mitigation bank is a good idea but suggested that this bank should be species-specific, unlike wetlands mitigation banks. Mr. Stein added that typical mitigation banks generally use credit/acre values relative to the impact and noted it could be difficult to determine this ratio. It would be difficult to establish a bank that covers all the species impacted. Mr. Stein wondered if there could be some flexibility to address representative birds (most impacted) but not specifically for all species impacted. Mr. James stated that a statewide mitigation bank should address local constituents' needs and be economically feasible.

Mr. Stein suggested the concept of a "green allowance" could introduce the fact that wind energy is trying to offset impacts to birds and bats from fossil fuel emissions; credits for this pollution free aspect would be helpful. A participant noted that the wind industry is already heavily subsidized due to its "green" value and expressed the opinion that it was uncertain additional subsides were needed. Perhaps "green" credit incentives could be provided to encourage developers to take measures

beyond the recommendations within the guidelines. A conversation ensued regarding whether or not wind industry deserved additional "green" credits. Mr. Flint noted that this "green" credit issue would have to rise to the state policy level, because although greenhouse gas emissions will be reduced with the expansion of wind developments the impacts to birds and bats will increase conversely.

Ms. Levin suggested it makes sense for large wind resource areas to develop HCP-like plans. Mr. James added that there is a need to outline as many models for mitigation as possible, including creative approaches that maximize the benefit to species as well as provide flexibility for project proponents. It will be important to bring all agencies to the table to ensure the same mitigation approaches are being applied.

Mr. Flint acknowledged that creating mitigation banks will take some effort. The fact that it will not be possible to mitigate for every species in one place will actually be a good thing because geographically-regional applications will be necessary. Mr. Stein noted that given wind is going to grow in California, a market for mitigation banks would be created if they were stated as an option in guidelines.

V. Open Discussion

Mr. De Morgan encouraged participants to respond to formal discussion questions that had not yet been addressed due to time constraints or that required additional contemplation, and/or any other subjects related to the general topics of impacts and mitigation.

> *Are there examples of successful implementation of seasonal shutdowns or other operational mitigation in reducing collision fatalities?*

It was noted that seasonal shutdown were occurring at Altamont and being studied but that the only reason they were agreed to at Altamont was due to the low winds prevalent during winter. It is premature to say whether the shutdowns have been successful or not, but from industry's perspective seasonal shutdowns in general would likely be a project killer.

> *How can mitigation options be structured to provide: (a) some certainty for mitigation implementation, and (b) some certainty for financial risk for wind developers?*

Ms. Levin stated there needs to be certainty for species and biological goals as well as financial certainty for developers included in the guidelines. Most questions on the agenda appear to be directed towards addressing industry's goals without balancing them with environmental goals. Ms. Sanders responded that there are very few options for doing mitigation in a way that provides certainty. Ms. Rader noted that if a situation arose with uncapped mitigation measures the project would not be built.

Ms. Levin noted that adaptive management is extensively implemented and although there are not many defined options for wind, currently available permits need to account for this approach. Ms. Rader agreed that if a range of impacts can be predicted, with some degree of certainty that everyone can agree to, industry can move forward with adaptive management with the recognition that bounds need to be placed on how far it will go. Ms. LeMay suggested that the adaptive management usually discussed includes the potential for seasonal shut downs, but we have heard from researchers that there could be acoustic/visual research ideas to help with avoidance. Industry's answer to the potential for seasonal shut downs right now is no, but that does not mean they cannot retrofit

technology as it is developed in the future. Ms. LeMay shared her belief that adaptive management does not only equate with taking out turbines, and her hope that tools to refine adaptive management approaches will be developed.

Ms. Levin inquired how to include the application of future technologies as they are developed within adaptive management. Ms. Rader replied if new technology is affordable and effective industry should institute the new techniques. Mr. Stein added that it depends on cost given that projects are financed based on the cost of current state of the art technology.

Mr. Stein proposed that if a mitigation bank was created, given some uncertainty about anticipated impacts from pre-permitting studies, and operations monitoring indicated an order of magnitude greater impacts were occurring, industry could just buy more credits to compensate. He clarified that industry would need to be pretty confident from pre-permitting monitoring what the bounds/cap would be. If significantly higher impacts occurred unexpectedly which were not anticipated based on good pre-permitting studies, the company would need to address the problem but possibly by buying more credits rather than a shut down. Ms. Sanders replied that permit conditions have a range of options for exceedence of thresholds and wondered how the guidelines could address this situation. Mr. Stein suggested that where uncertainty exists the guidelines could provide for a specific range of options triggered at some threshold.

Ms. Vance clarified that CDFG does not issue permits automatically, only for CESA related to sensitive species. The lead CEQA agency issues approval, with CDFG providing input throughout the CEQA process to help guide their decision. Enforcement for take of birds is where CDFG authority lies. A CESA permit comes into play early on when it is known that sensitive species are present or during early consultation and/or public review when industry thinks there is not a problem but CDFG disagrees. Some project proponents take proactive steps, some are forced into the process. CEQA allows lead agencies broad discretion, so broad experimental mitigation could be incorporated. CESA permits also have re-opener clauses for cases with high uncertainty; monitoring is conducted and check-in points to review results are established. Ms. Sanders suggested the guidelines could say that CDFG should be consulted to help in making decisions about key biological issues. It was noted that in areas where it is believed there are no sensitive species present and impacts are expected to be less than significant, CDFG will want to see pre-permitting survey results to prove the claim.

> *How much detail should the guidelines include on mitigation options? For example, should the guidelines provide suggested language for avoidance and compensatory mitigation that could be used by a lead agency in their permit conditions?*

Ms. Levin suggested that the guidelines could propose a Technical Advisory Committee be established to help evaluate and provide recommendations for different kinds of mitigation. Ms. Sanders shared an observation that similar permit language has been circulating and that she thought it could be helpful to offer more detailed guidance to assist with permitting applications. Mr. Stein added that counties will be looking to learn from other counties' permitting language as it is developed.

Mr. Stein inquired if there is an initiative in CDFG to get the message out to their representatives about this guidelines process. Mr. Flint replied CDFG is involving all staff who routinely deals with wind as well as ensuring someone from every region participates. While CDFG does not yet have consistent internal policies they are doing the best they can to assess where they have been and where they are going. Mr. Sterner informed the group he was brought on to help facilitate regional and main office level discussions. Ms. LeMay stated industry would support the creation of a CDFG

specialist position to address this issue; similar to the FAA's establishment of an office dedicated to wind. Ms. Levin suggested CDFG attend Budget Subcommittee hearings along with Audubon Society and World Wildlife Federation to advocate for more resources in the hopes of establishing such a position/office.

VI. Next Steps

Ms. Ward provided the following overview of next steps related to this workshop:

- Deadline for written comments on this staff workshop is close of business October 5.
- This workshop summary will follow the same protocol as the last one; it will be distributed (by RESOLVE) to attendees for review and comment with the final version posted on the CEC website.

Ms. Ward noted that CEC realizes there is a great deal of information from workshops and written comments that needs to be incorporated into the draft guidelines. In addition, the planning for this 'remote' workshop took a significant investment in time; therefore it appears that the beginning of November may not be realistic for the timing of the next staff workshop. CEC will email notice of details for the next workshop as soon as they become available. Currently three options for location are being considered (San Gorgonio, Sacramento and the Bay Area.) She stated that after the next Staff workshop there will be two more workshops chaired by the Committee.

Ms. Sanders added that the topic of the next workshop will be the draft guidelines and CEC and CDFG wants stakeholders to have some time to review the document before discussing it at the next workshop. It is likely that discussions will focus on addressing points of disagreement between stakeholders and suggestions for alternatives. CEC is proposing going through the guidelines from beginning to end but stakeholder thoughts on this approach are welcome.

Ms. Levin inquired if the release date of the draft guidelines was known so that stakeholders could provide initial feedback to help in designing the agenda. Mr. York replied that CEC needs time to incorporate feedback received from stakeholders and SAC as well as for internal review. Ms. Ward added that CEC has several internal meetings planned to finalize a timeline for release. She acknowledged that the more time CEC has to develop the draft and allow for initial stakeholder review to get feedback before shaping the agenda the better. Mr. Stein suggested waiting for release of the draft guidelines and subsequent initial stakeholder feedback to determine an order for agenda topics rather than conducting a straight run through the guidelines.

It was suggested that at least 10 days would be needed for stakeholders to review the draft in preparation for the workshop discussions and to provide informal feedback to help in shaping the agenda. CEC indicated that the goal is to produce something of value; therefore CEC will strive to establish a timeline for release of the draft guidelines and the subsequent Staff workshop which allows for meaningful stakeholder involvement. It was noted that formal adoption of the guidelines was scheduled for February 14, 2007.

In closing, stakeholders provided feedback on the following items related to the next staff workshop and draft guideline issuance:

Staff Workshop

- Location
  - Bay Area
    - Consider asking state agencies to help arrange room and technology needs
    - It is easy to travel from the Bay Area to Sacramento so it may not be worth the trouble
  - Want to include planners and location may influence their participation
  - Remote locations present challenges (travel and technology)
- Conflicts for dates
  - November 1-3
  - November 9-10
  - November 13-16
  - November 14-16: NWCC Wildlife Workgroup Research Meeting VI
  - Consider having stakeholders send black out dates to CEC?
- Duration of workshop
  - 2 days
- Format
  - Do not rule out presentations from other stakeholders; (presumption is CEC and CDFG staff will not be making presentations)

September 27-28 California Energy Commission Avian Guidelines Workshop Attendees

Dick	Anderson	Science Advisory Committee
Ken	Arnold	M. H. Wolfe and Associates
Mike	Best	Pacific Gas and Electric
Jennifer	Bies	RESOLVE
Peter	Bloom	Bloom Biological
Greg	Blue	EnXco
Paul	De Morgan	RESOLVE
Mark	Dedon	Pacific Gas & Electric
Melinda	Dorin	California Energy Commission
Scott	Flint	California Department of Fish and Game
Garry	George	LA Audubon Society
Bronwyn	Hogan	California Department of Fish and Game
Ted	James	Kern County
Joel	Klipp	Anemos Consulting
Brenda	LeMay	Horizon Wind Energy
Julia	Levin	Audubon California
Andy	Linehan	PPM Energy
John	Mathias	California Energy Commission
Annie	Mudge	CalWEA
Samantha	Murray	Golden Gate Audubon Society
Lorelei	Oviatt	Kern County
Nancy	Rader	CalWEA
Susan	Sanders	California Energy Commission
Mark	Sinclair	Clean Energy States Alliance
Stuart	Smith	Oak Creek Energy Systems
Linda	Spiegel	California Energy Commission
Kenny	Stein	FPL Energy
Dave	Sterner	California Department of Fish and Game
Annette	Tenneboe	California Department of Fish and Game
Robert	Thresher	National Renewable Energy Laboratory
Arthur	Unger	The Sierra Club – Kern-Kaweah Chapter
Paul	Vercruyssen	Center for Energy Efficiency and Renewable Technologies
Julie	Vance	California Department of Fish and Game
Joe	Vincenty	California Department of Fish and Game
Misa	Ward	California Energy Commission
Chris	White	Oak Creek Energy Systems
Linda	White	Kern Wind Energy Association
Kerry	Willis	California Energy Commission
Marcia	Wolfe	M. H. Wolfe and Associates
Rick	York	California Energy Commission